Meeting today's management needs while planning for the future

Pinellas County's Urban Forest

Urban Forest

- ***Urban forests*** *are systems of trees, other vegetation, and water within any urban area.*
- *They can be understood as dynamic green infrastructure that provides cities and municipalities with environmental, economic, and social benefits.*
- *Urban forests are forests for people.*

Vibrant Cities & Urban Forests report (2011).

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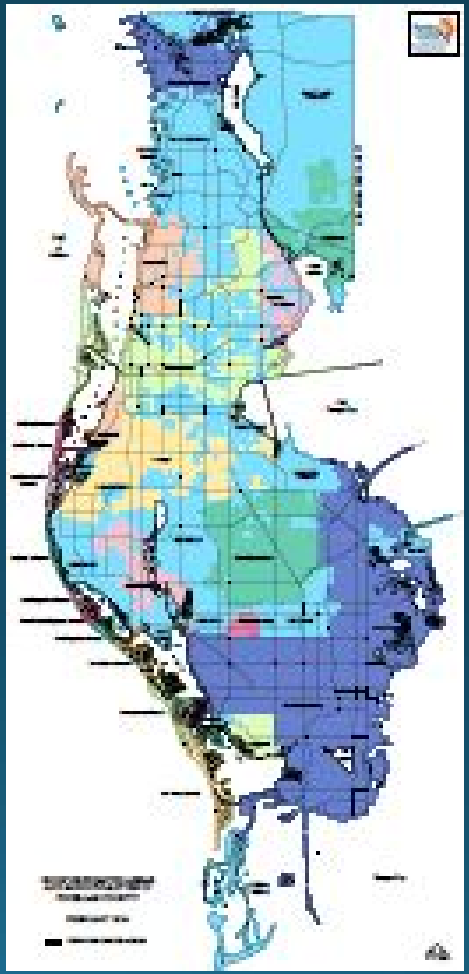
Sustainability

- Managing the urban forest to meet the needs of the present without compromising the ability of future generations to meet their needs.*

*Commission on Environment and Development (WCED)

Pinellas County

- Most densely populated county Florida
  - 3347 people per square mile
- County wide population ~1,000,000
- 280 miles^2
- 588 miles of coastline
- 110 ft. at the highest location
- 4521 miles of paved road



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Needs

- What are our needs from the Urban Forest?
- How does the Urban Forest function for us now?
- How do we want it to function for us in the future?

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Continuity over time

- Comprehensive plan goals (10 year plans)
- Carbon output reduction: sequester carbon through green infrastructure: trees, plants, soil
- Minimum canopy cover
- Tree diversity and tree age and distribution
- Equity

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Function

- Structure function and value
- Ecosystem services
  - Air quality improvement, stormwater runoff reduction, carbon storage, wildlife habitat, and energy conservation
- Goods
  - Food and wood products
- Value
  - Social, economic, and health benefits
  - Aesthetic
  - Monetary

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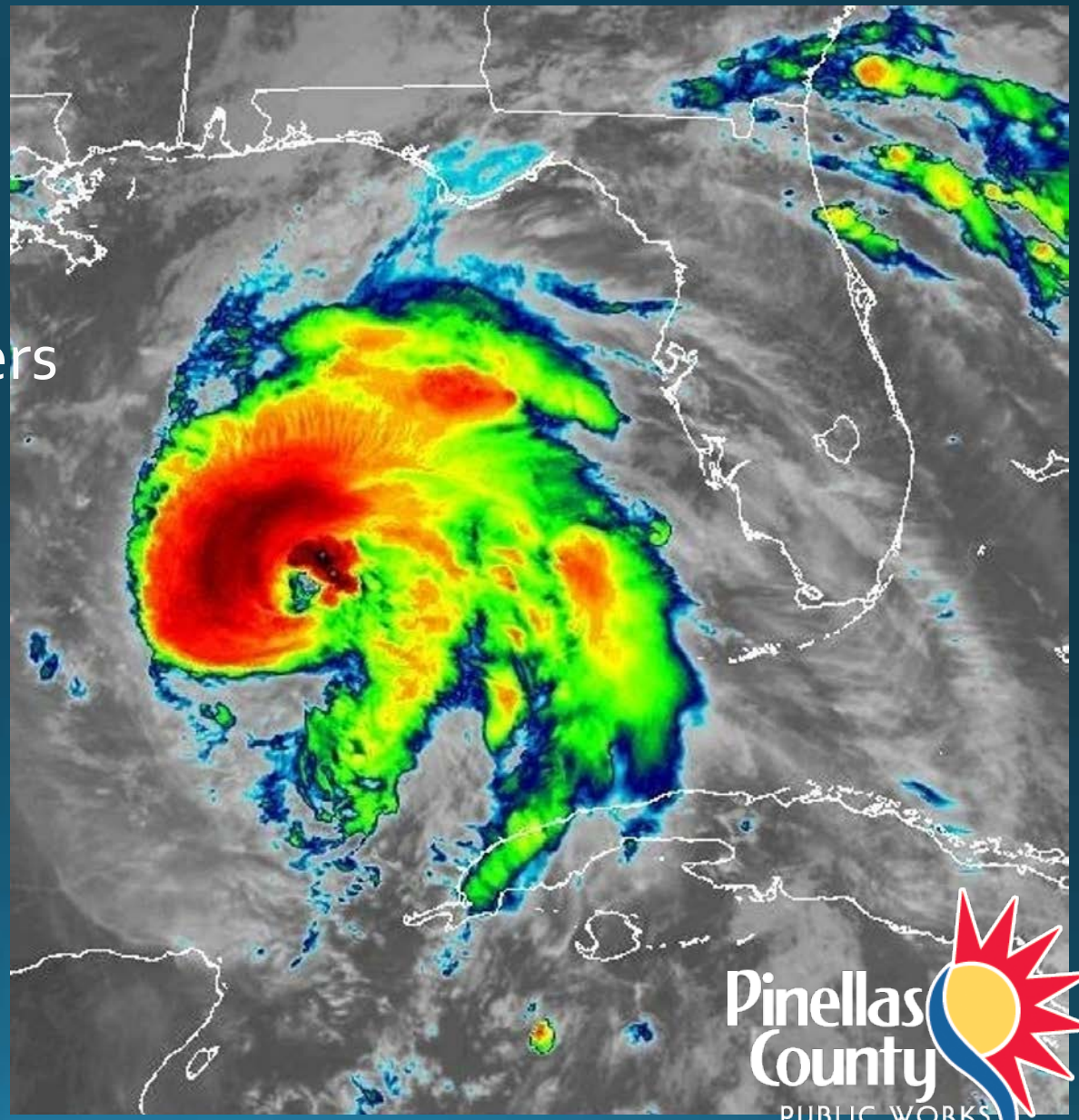
Forces

- Climate change
- Storms and other natural disasters
- Insects
- Disease
- Age and decline of existing trees
- Invasive plants
- Development
- Equity
- Forest management



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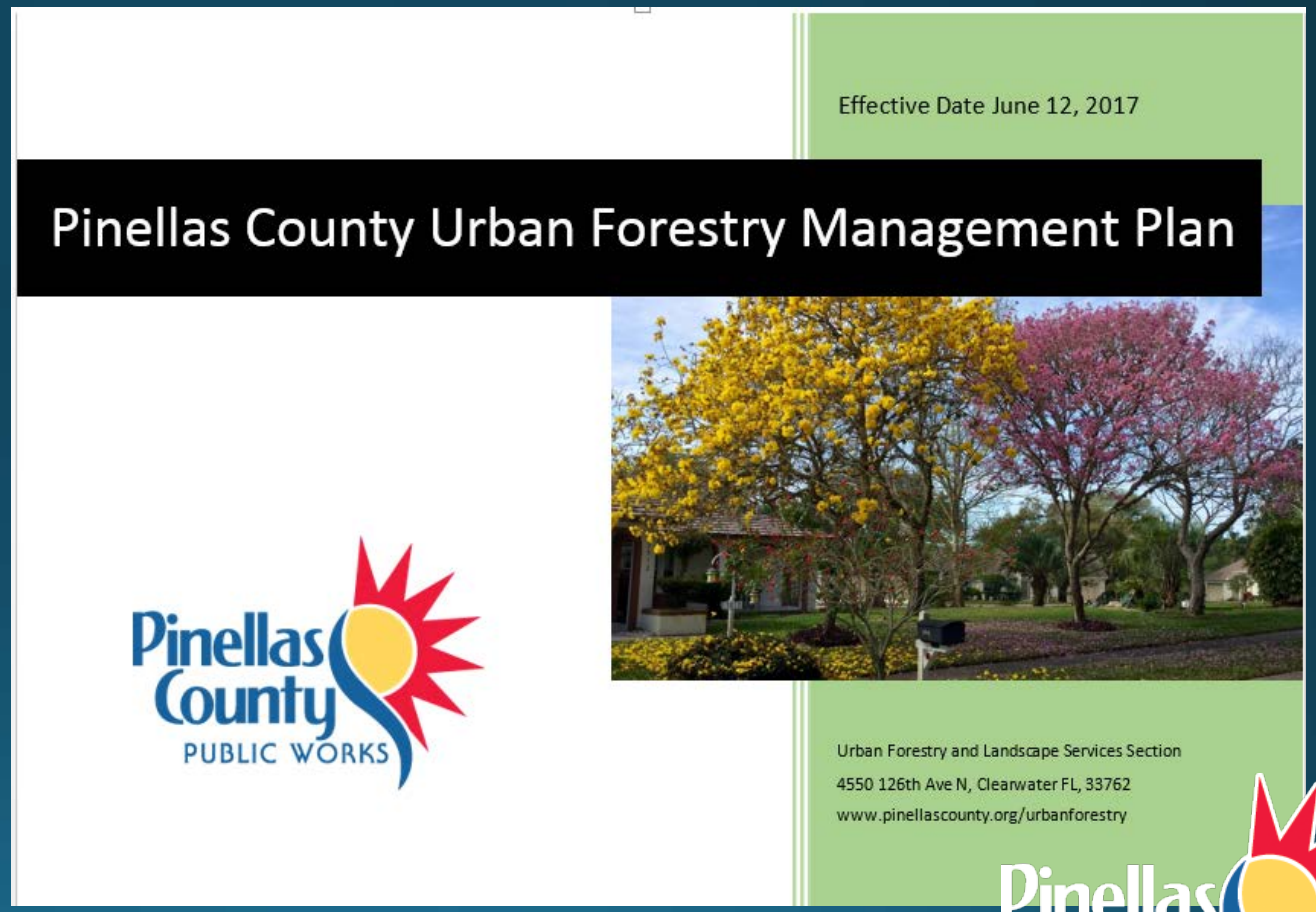
Management and design

- Species distribution
- Age class distribution
- Geographic distribution
- Management cycles



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Seeing the Forest

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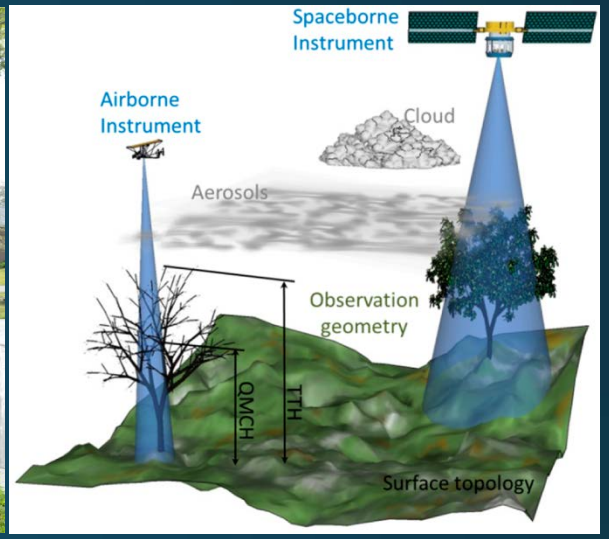
How do we do it??

- **Ground up approach**
  - In the field traditional forestry
    - Urban tree inventories



- **View from above approach**
  - Present and future of traditional and urban forestry assessment
    - Point based tree canopy assessment
    - Remote sensing canopy assessment and planning
      - Satellite and LiDAR datasets

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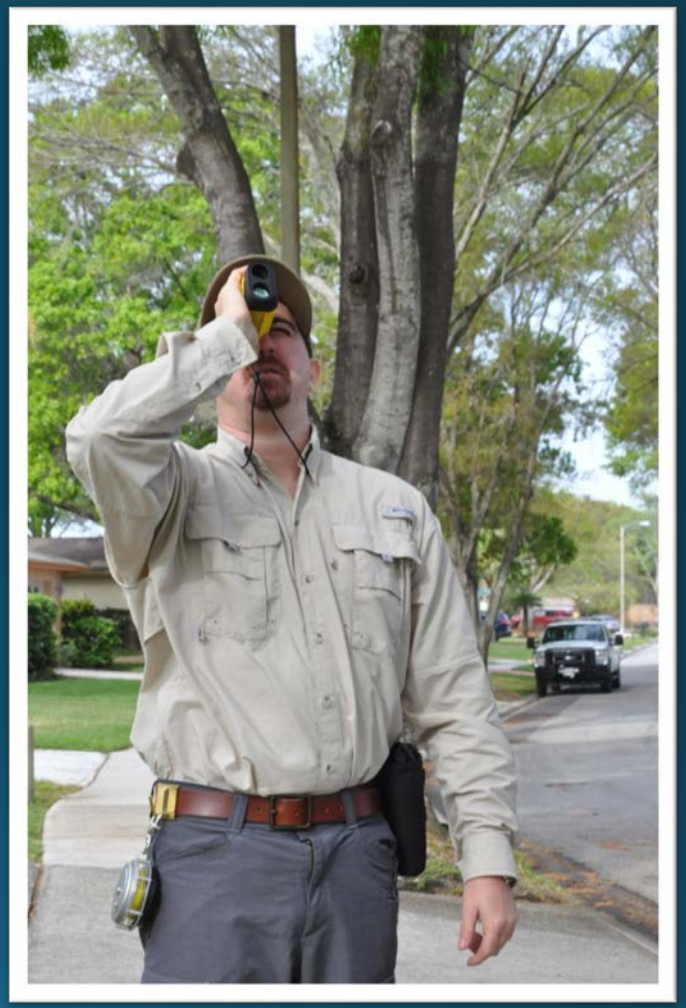
From the ground up

- Pinellas County Tree Inventory
  - iTree Streets data format
- Pinellas County Road Census
  - Windshield street tree counts
- Google Street View Asset Allocation
  - Street tree spatial locations



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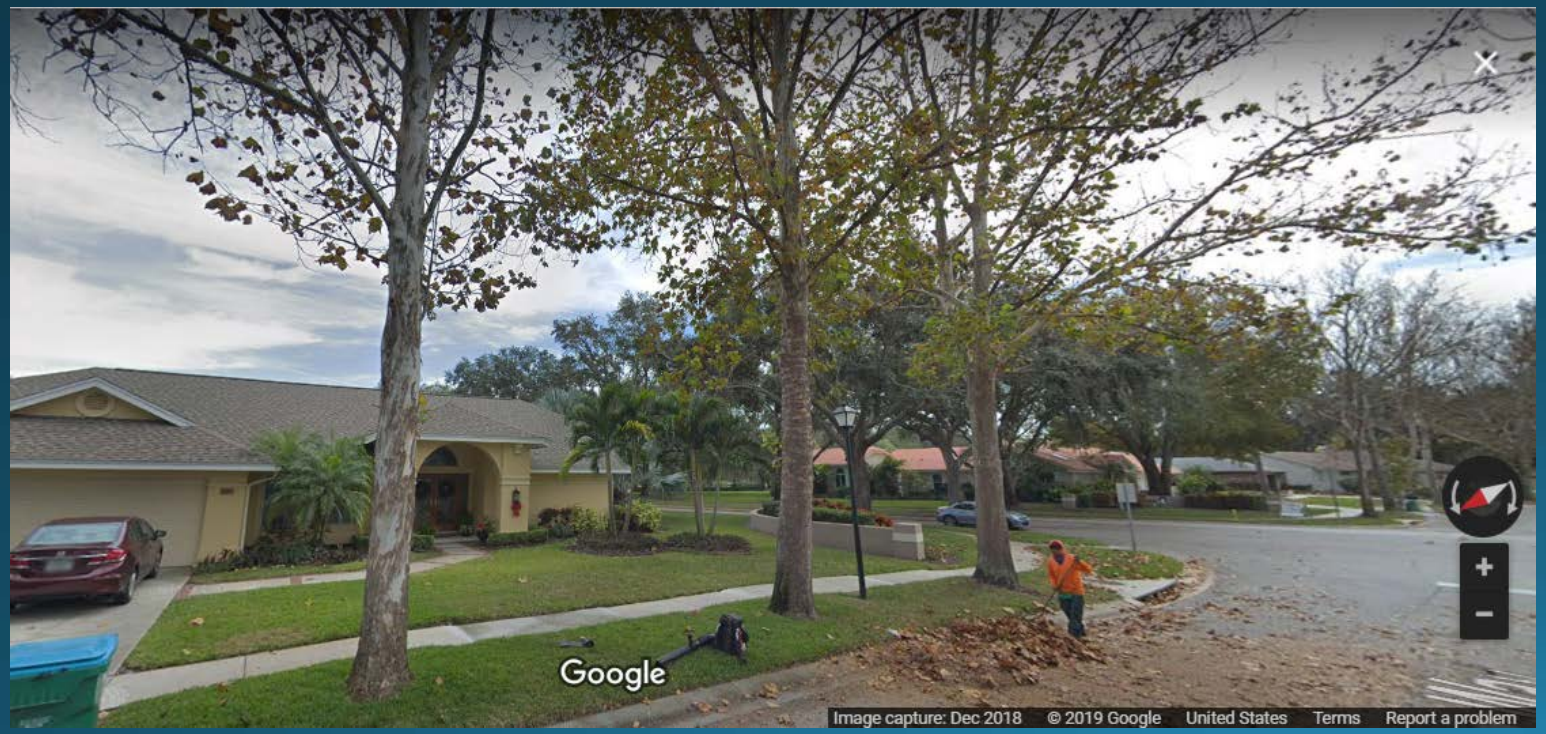
From the ground up

- Inventory: >11,000 trees measured
- Arterial census outputs: >15,000 trees counted (arterial roads)
- GSV Asset Allocation: Arterial road census follow-up



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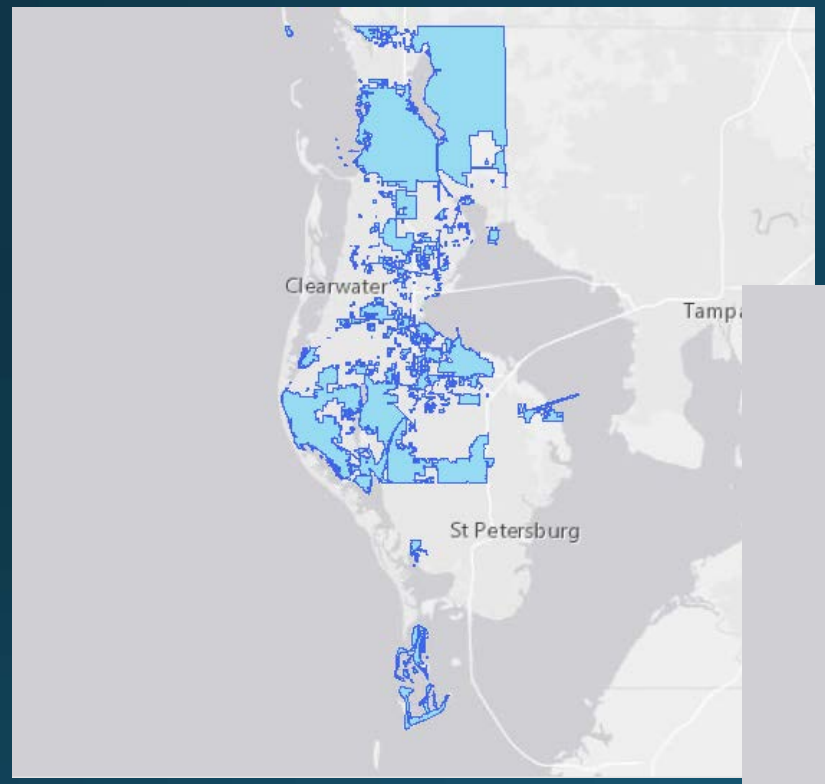
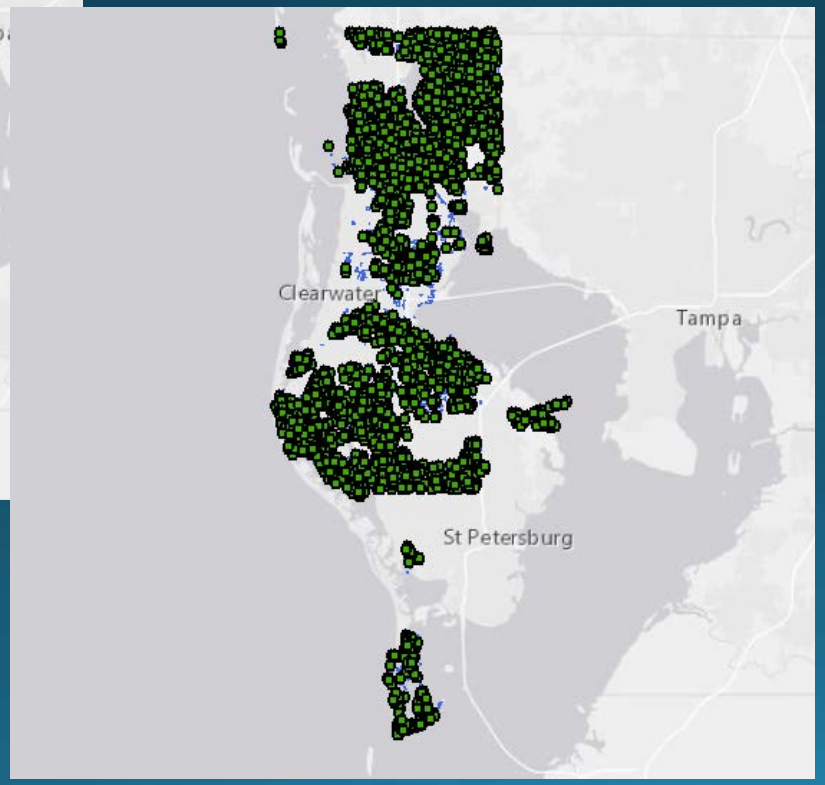
View from above approach





- Pinellas County Urban Tree Canopy Assessment
  - 35% canopy cover
  - 4000 points classified
- Pinellas County Urban Tree Canopy Cover
  - 43% canopy cover
  - LiDAR derived

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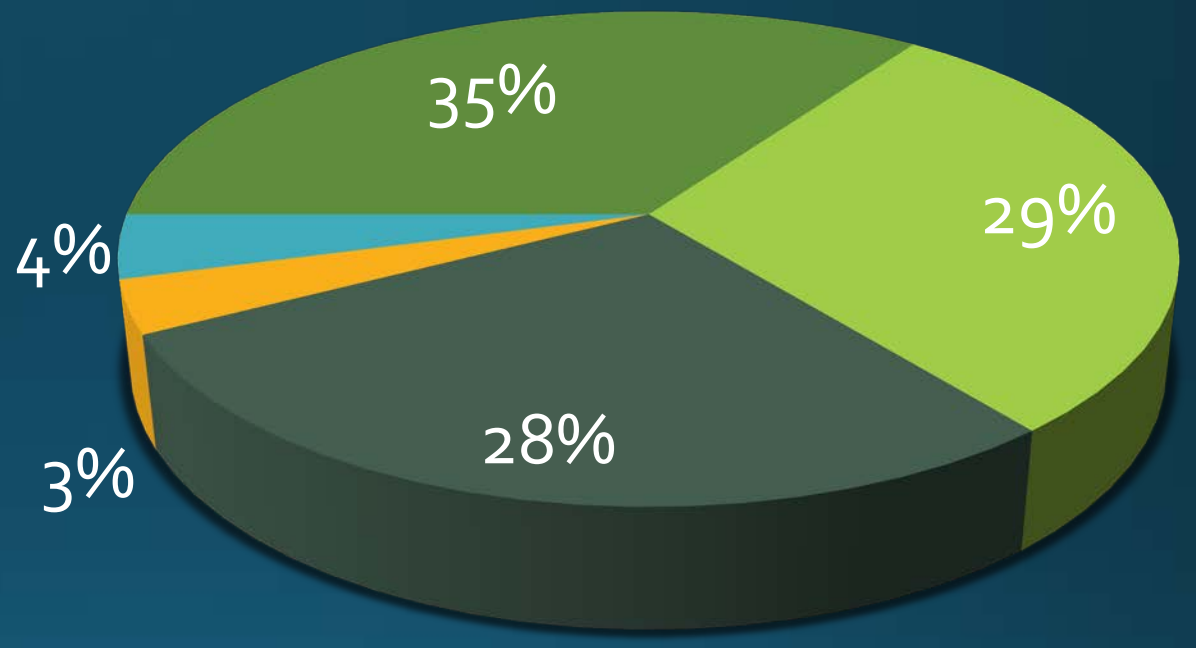
View from above

- Point based canopy results

Classification	Percent cover	CI	CI Min	CI Max	SE
Tree canopy	35%	1.5%	33%	36%	0.75%
Grass/ Low veg	29%	1.4%	28%	31%	0.72%
Impervious	28%	1.4%	27%	30%	0.71%
Bare soil	3%	0.6%	3%	4%	0.29%
Open water	4%	0.6%	4%	5%	0.32%

Pinellas County Percent Cover



Tree canopy
Grass/ Low veg
Impervious
Bare soil
Open water

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Pinellas County LiDAR Canopy Coverage

Planting for today and tomorrow

70% of trees inventoried in the genus Quercus (oaks): 35% live & 33% laurel

- Underutilized species
- Long lived species
- Broad environmental tolerance range
- Diverse structural forms
- Wind resistant species
- Armillaria resistant species
- Other pest and disease resistance

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Sustainability

"The true meaning of life is to plant trees, under whose shade you do not expect to sit."
—Nelson Henderson.